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SEMI-ARID FOOD GRAIN RESEARCH AND DEVELOPMENT AGENCY

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FOOD GRAIN RESEARCH AND DEVELOPMENT
IN THE SEMI-ARID ZONE OF AFRICA

1986 - 2000

ORGANIZATION OF AFRICAN UNITY
SCIENTIFIC, TECHNICAL AND RESEARCH COMMISSION

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CHAPTER I

INTRODUCTION

1. In their efforts to alleviate the recurrent food problems the continent has been experiencing during the past quarter century, African Governments adopted a series of Plans and Declarations to bring about an immediate improvement in the food situation and to lay the foundations for achieving self-reliant, self-sustaining and steady progress in the development of agriculture in Africa. In particular, the food and agriculture aspect of the Lagos Plan of Action (1980) which was closely linked to the regional Food Plan for Africa (1978) set a number of targets, including a growth target of 4 per cent per annum for the agricultural sector which, if achieved, would eventually have brought about food self-reliance on the continent.

2. Despite the adoption of these two plans, the overall food and agriculture output worsened to reach a crisis proportion. Since 1984 almost half of the Member States of the Organization of African Unity are dependent on food aid. To reverse the unfavourable trend in the agriculture and economic development of Africa, a Special Memorandum was adopted by the ECA Conference of Ministers on Africa's Economic and Social Crisis in May 1984. A further powerful reaffirmation of the political commitment in LPA was given in the Harare Declaration on Food Crisis in Africa, adopted by the Thirteenth FAO Regional Conference for Africa in July 1984. This Declaration seeks to give force and to concretize the policy guidelines of the LPA against the background of the existing serious food crisis including major steps toward food self-reliance and food security.

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3. Furthermore, in November 1984, the Assembly of Heads of State and Governments expressed grave concern over the extent and the persistence of the economic and social crisis in Africa, while the 1984/1985 UN General Assembly adopted a report on the Critical Economic Situation in Africa. In July 1985, the Assembly of Heads of State and Governments adopted, inter alia, a Special Programme of Action for the Improvement of the Food Situation and Rehabilitation of Agriculture in Africa. Concrete proposals including correcting the inconsistency between the declared objectives of giving high priority to the food and agriculture sector and the official actions were made in this report. In particular, the African governments committed their countries to the gradual increase in the share of agriculture in national total public investment of between 20 and 25 per cent by 1989.

4. The extent of hunger and malnutrition in Africa calls for resolute action including the effective mobilization and judicious exploitation of national and collective potentials on the basis of well-formulated development strategies and plans so as to pave the way for national and collective self-reliant and self-sustained growth and development. The importance of research and training particularly in the framework of regional cooperation to achieve the objectives of accelerated food development were duly emphasized. It was especially stressed that unless immediate actions are taken toward the improvement in agricultural technology to revamp the established traditional farming systems, the continued increase in population will lead to further declines in per capita farm output. This, in turn, will lead to increased dependency of Africa on outside supply of food and further deterioration in the performance of the overall economy.

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5. Though it is recognized that considerable efforts were directed toward improving and developing agricultural research in Africa, little progress has been achieved in providing adequate support for producers of major food crop. Indeed, no major breakthrough has been achieved in genetic improvement of rainfed millet and sorghum which account for 80 per cent of the cultivated land in the Sahel and other areas of low rainfall. Also, major advances like those which revolutionized wheat and rice cultivation in Asia have not been made since the 1960s in Africa.

6. The weakness of agricultural research are not simply or even mainly a matter of staff and money but they are arising from the poor and ineffective research policy at national, subregional and international levels. At national level the lack of effective staff management and career development policies combined with the inadequacy of research operating funds had resulted in a disruption of even well designed research programmes and a failure in building an effective indigenous national research capacity and extension systems. Therefore, Africa continues to rely heavily on outside world for the generation and transfer of improved technologies to the ultimate users including small farmers. Because of the complexity of the environment and the magnitude of the agricultural research problem facing Africa, combined with excessive duplication of efforts and conflicting focus among donors, performance of outside assistance including through the International Agricultural Research Centres (IARCs) is far below expectation.

7. To reverse the unfavourable performance of agricultural research in Africa, there is an urgent need for greater and effective cooperation and coordination among African countries so as to achieve greater individual and collective self-reliance in agricultural research and efficient allocation and use of outside assistance to research in Africa. The Lagos Plan of Action as well as the recent Declaration of Addis Ababa provide the

appropriate framework including mandates for such cooperation and coordination to take place.

8. Specific experience of the Scientific, Technical and Research Commission (STRC) of the OAU, over the last ten years, through its Semi-Arid Food Grains Research and Development Project (SAFGRAD), confirmed that subregional cooperation and coordination can greatly enhance the productivity as well as reproductivity capacity of agricultural research, thereby bringing it more oriented toward the farmer for improved productivity and production. On-going efforts of OAU/STRC should be intensified in the semi-arid zones so as to help accelerate food production and agriculture rehabilitation in Africa.

9. The present document is part of the efforts of OAU/STRC to help mobilize the required resources especially human, financial and natural, at national, subregional, regional and international levels, with the view of strengthening the capacity of SAFGRAD to effectively play its primary role of catalyst on the generation and transfer of improved technologies to the producers of the semi-arid zones. These efforts aim at accelerating the attainment of individual and collective self-sufficiency in major crop production including millet, sorghum, maize, groundnut, bambara nut and cowpea, of the semi-arid zones of the continent.

CHAPTER II

The Semi-Arid Food Grain Research and Development Agency:

History, Achievements and Future

A. HISTORY OF SAFGRAD-

10. Thanks to the assistance of the United States Agency for International Development (USAID), regional research on food crops including millet, sorghum and maize began in 1964. Five years later this programme was divided into two subregional projects covering the countries of the then East Africa Community and those of West Africa in collaboration with the Institute for Agricultural Research (IAR) at Ahmadu Bello University, Samaru, Nigeria and the OAU/STRC. The West Africa project known as Joint Project 26 (JP26) was also the beginning of multi-donors research efforts in the subregion.

11. The encouraging performance of JP26 combined with an acknowledged need for continuation and strengthening of collective efforts toward generating and transferring suitable and improved technologies resulted in the preparation of a research and development project covering the major crops including millet, sorghum, maize, groundnut and cowpea of the Semi-Arid Zone of the African Continent. More specifically, the research objectives of the Project called the Semi-Arid Food Grain Research and Development (SAFGRAD) Project, were stated as follows :

- (i) Varietal improvement with an emphasis on breeding desirable characters and resistances into promising varieties with broad applicability in the region;
- (ii) Farming systems to identify approaches and improved technologies which are best suited to small farmers; and
- (iii) Soil management aimed at maintaining/increasing soil fertility.

12. The project covered 18 countries at its inception in 1977. However, this number has been increased to include, in 1985, more than half of the member states of the OAU, including Benin, Burkina Faso, Botswana, Cameroun, Cape Verde, Chad, Central African Republic, Ethiopia, Gambia, Ghana, Guinea, Guinea Bissau, Ivory Coast, Kenya, Mali, Mauritania, Niger, Nigeria, Sierra Leone, Senegal, Somalia, Sudan, Tanzania, Togo, Uganda and Zambia. There are indications that this number will further increase to cover more countries.

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13. Initial support for the Project was provided by the United States of America, United Kingdom, France, Netherlands, Canada, European Economic Community, the United Nations Development Programme and the host countries for a five year^{period} and a funding level of about US \$13,9 million. USAID and the host governments' respective shares in the budget were about 65 and 7 per cent. Additional support obtained mainly from USAID, and the International Fund for Agricultural Development (IFAD), France and the OAU, extended the project activity completion date to 1987, for some activities including training, farming systems research and increased the funding level to US \$21.1 million.

B. ACHIEVEMENTS

14. The major achievements of SAFGRAD over the last decade are the development of approaches which help to translate into concrete actions and programmes the principle of greater collective and individual self-reliance in agricultural research and the objective of effective coordination and integration of the activities of the IARCs to play an active supportive role. These include :

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- the choice of few but major food crops on which to concentrate efforts in the semi-arid zones of Africa;
- the choice and support of key selected existing NARCs to serve as main stations for subregional activities in cereal, grain legumes research and farming systems research, compatible with the ecological zone they represent;
- the choice of selected countries as cases for testing the Accelerated Crop Production Programme (ACPP) designed for strengthening the linkage and improving the communication between the research, training, extension and farming community, thereby accelerating crop production on farm;
- the support of regional scientific conferences, technical publications and information, training for African scientists and technicians and other forms of regional cooperation to facilitate the exchange of information and experience between researchers in Africa;

These programmes are all major steps toward building the indigenous capacity of the NARCs and extension services, thereby helping Africa to be individually and collectively self-reliant in agricultural research;

- the development of dynamic collaborative research support programme with key IARCs to foster joint actions among them and between them and the NARCs and extension services on SAFGRAD programme. This has paved the way for improved efficiency in the performance of these institutions in terms of increased agricultural productivity and production;
- the establishment of Policy organs namely the Consultative Committee (CC) assisted by the Technical Advisory Committee (TAC) ..

These organs establish policy guidelines for general planning, identification of research problems of a regional significance, monitoring progress towards their solution and establishing corrective courses of actions where needed;

- the establishment of a Coordination Office under the umbrella of OAU/STRC. This office, guided by its Policy organs is endowed with professionally competent staff where administration emphasized leadership more than authority and help mobilize national, regional and international resources for vigorous coordinated and concerted efforts related to the generation and the transfer of improved technologies. It is especially entrusted with the research coordination management and therefore acts as facilitator for research activities in member countries. The headquarters and the West African subregional office are in Ouagadougou while the Eastern Southern subregional office is in Nairobi, Kenya.

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15. Specific achievements of SAFGRAD since its inception in 1977 include :

- the sponsoring of ~~16~~⁹⁶⁰ workshops attended by an average of 54 African scientists and other international crop breeders, agronomists, agricultural economists to exchange ideas and information and to plan variety trials;
- the organization of annual monitoring tours for small groups of scientists (8-12) to see on-going variety trials and other relevant research activities in 3-5 selected member countries;

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- the establishment of regional networks to bring together scientists from different member countries to share their experience and exchange planting materials and information. Networks have been established for maize/cowpea involving scientists from nearly all the member states, for sorghum/millet covering 12 countries in Eastern and Southern subregion. A third network involved mainly the Accelerated Crop Production Officers (ACPOs) of the five countries in which the programme operates;
- the establishment of Accelerated Crop Production Programme (ACPP) in Burkina Faso, Cameroon, Mali, Senegal and Togo, succeeded in providing a bridge between training, research, extension and farmers. The ACPOs conducted trials in farmers' fields on new crop varieties and technologies developed in national, regional and international research stations;
- some progress has been achieved in identifying and developing improved varieties of sorghum, millet, maize and cowpea which are comparatively early maturing, disease and pest resistant, drought tolerant and high yielding. Some of these varieties have been released to several national programmes for further testing and use;
- ~~limited~~ progress has been achieved in soil-water management research and farming systems research;
- the provision of support for the training of 30 scientists at higher degree (MSc. and Ph.D) levels in the fields of agronomy, plant breeding, agricultural economics, soil science, crop protection, plant nutrition and agricultural engineering and of 80 for short term training involving a few weeks to six months in laboratory methodologies and various aspects of field training.

16. Despite some shortcomings, SAFGRAD has played, over the nine years of its existence, a positive part in institutional activities concerned with the furthering of agricultural research on its mandated crops in Africa. In particular, it has demonstrated, through its research coordination mechanisms, that it is well possible in Africa to achieve a welding and coordination between research, teaching and extension interests, so that research findings may be rapidly translated into practice in the farmers' fields. Therefore, the need to continue to strengthen the work of SAFGRAD particularly in these era of widespread famine and hunger in Africa, cannot be overemphasized.

C. THE FUTURE OF SAFGRAD

17. In the light of its achievements detailed in various Progress Reports and the recommendations of the 1984 USAID/OICD Evaluation Team, the Consultative Committee recognized the need for greater and sustained efforts at both national and international levels for furthering the mandate and scope of SAFGRAD. Consequently, the Committee in its 1984 meetings called upon OAU/STRC to prepare a comprehensive Master Plan for SAFGRAD for the next 10 to 15 years. This Plan prepared by OAU/STRC Consultants has served as a base for the preparation of the SAFGRAD Indicative Master Plan which was discussed and approved at an Extraordinary Meeting of the Committee, held in Ouagadougou Burkina Faso, from 19-22 August, 1985.

18. At this meeting, the work priorities have been clarified, redefined and oriented more specifically towards Africa's immediate and more urgent needs. SAFGRAD is particularly expected to play an effective role in the implementation of the Five Year Special Programme for the Improvement of the Food Situation and Rehabilitation of Agriculture in Africa adopted by the 1985 OAU Assembly of Heads of State and Government. SAFGRAD therefore should aim at more impact from both subregional and international cooperation through a stronger focus on key research and development issues, greater emphasis on the rationalization and coordination of agriculture research and

development policies on mandated crops at subregional and regional levels, better management and coordination of resources including directing it on projects that stimulate growth of indigenous research capability and the farmers' initiative for self-sustained and improved production and maintaining regular and constructive dialogue among all parties, especially Africans, so as to make them understand each other's perspectives and problems. Also, in recognition of the long term nature of research, the Committee decided that SAFGRAD should function as a Research Coordinating Agency under the OAU/STRC instead of a Project. Further, it was decided that all grant should be made to OAU/STRC who would then award the contracts, including to IARCs, in close contact with the donor agency.

19. As a follow-up to the adoption of the Indicative Master Plan, the Committee called upon the OAU/STRC to translate into project ideas the contents of the Master Plan so as to help mobilize the resources required for SAFGRAD to play effectively its role in developing the agricultural resources in the semi-arid zones of Africa. In pursuance of the agreed conclusions of the above-mentioned Extraordinary Meeting of the Committee, the OAU/STRC requested the collaboration of the Secretariat of the United Nations Economic Commission for Africa (UNECA) to help prepare the present document.

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CHAPTER III

PRIORITY AREAS FOR INTERVENTION

20. The priority areas needing urgent attention to substantively improve the delivery capacity of agricultural research centres dealing with the mandated crops in the semi-arid zones were identified and analysed by the Policy Organs of the Agency. These include institutional development and specific programmes related to the accelerated generation and transfer of improved technologies that are suitable to the farming conditions of the semi-arid zones and which will help to resolve the threat of famine, develop self-sufficiency in cereals and raise the nutritional level.

A. INSTITUTIONAL DEVELOPMENT

21. Owing to the cost and long term nature of agricultural research only few countries in Africa can afford past research strategies based on greater individual self-reliance and self-sufficiency. Moreover there is growing recognition in the international community that efforts should be coordinated particularly at subregional levels, if any tangible dividends are to be obtained from investments in research. Therefore, to achieve notable progress and sustained results in the field of agricultural research and thereby in agricultural production, African countries must, effectively adhere to their principle of collective self-reliance, implying the pooling of manpower, institutions and scarce resources, including financial and genetic materials.

22. As far as the semi-arid zone is concerned, SAFGRAD, under the umbrella of OAU/STRC and its Policy Organs, provide appropriate mechanisms for coordinated and concerted regional efforts. Therefore they should be

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endowed with adequate resources to assume the leadership role in defining priorities and coordinating efforts in the design and implementation of research programmes. In particular, they should ensure that both governments and donors commit themselves to providing long-term, steady and reliable support to the programmes of SAFGRAD. These commitments should be clearly specified, agreed, firmed and monitorable.

23. Also, as an OAU Agency and administering institution of grants, OAU/STRC through SAFGRAD should pay greater attention to strengthening and reorientating national, subregional and international programmes toward developing a more focused and comprehensive work programme and establishing closer linkages between national, subregional and international institutions working on its mandated crops. In particular, the international institutions such as ICRISAT, IITA, CIMMYT, ICIPE, should be encouraged to continue and expand the more basic long-term research required on semi-arid agricultural problems while the regional and national research centres and extension services should improve their productive and reproductive capacities so as to achieve and maintain higher level of productivity and on-farm production.

24. As it was observed during the first phase of the Project, major shortcomings were due to deficiencies in the operation and functioning of the Policy Organs and the Coordinating Office, every effort should be undertaken to not only correct these, but also to ensure the smooth execution of their respective mandates. Such efforts will also involve increased support for institutional development to existing and planned regional centres such as the Institute of Agricultural Research in Samaru, Nigeria, the Centre National de Recherche Agronomique (CNRA) of Bambey, Senegal and the Kamboinse Research Station, to the cooperative IARCs, including ICRISAT, IITA, CIMMYT, GIRAD, WAFRN, ILCA, ICIPE, and to the national centres serving as satellite stations.

B. GENERATION OF RELEVANT TECHNOLOGIES

25. The model advocated for Africa to make available technologies to farmers was biased towards international transfer of advanced technology, particularly plant materials through IARCs and NARCs. The results were generally disappointing since very little of the imported technology was adapted to the African conditions, including production scales, structure of farms and access to complementary inputs needed with this technology. There is a growing awareness that this approach should be reviewed and that more attention should be given to a balanced model between basic science and applied research.

26. The approach of SAFGRAD, composed of three components which are all complementary seems to yield positive results in generating technologies which are not only relevant to the needs and environments of the farmers but also have chance to be adopted by them. This approach is based on the following :

- Collaborative Research Support Programme provides a means by which the talents of research scientists particularly in IARCs and regional centres, can be mobilized to focus their collective efforts on solving long-term agricultural research problems of common interests. On-going programme aimed at improving local and developing new crop varieties with acceptable consumer qualities which are high-yielding, pest and disease-resistant and drought-tolerant. Also actions are directed toward developing efficient soil-water management and other suitable and appropriate agronomic practices. Specifically there is a SAFGRAD/ICRISAT sorghum and millet improvement sub-programme and SAFGRAD/IITA maize, cowpea and soil-water management improvement programme;

- Regional Research Support Programme by which selected NARCs which are representative of a given ecological zone and willing to accept and participate in basic and adaptive research which is regional in scope are given support. Currently the Institute for Agricultural Research at Ahmadu Bello University, the Centre National de Recherche Agronomique at Bambeay and the Kamboinse Research Station have SAFGRAD-funded scientists to conduct research which is regionally oriented ;
- Research Network Support Programme. A series of networks were established in the semi-arid zones to bring specialists to share experience considered mutually beneficial to members including those related to the generation of improved technologies especially by the IARCs and the Regional Research Centres. Such mechanism helps in the coordination and integration of activities of NARCs, Regional Centres and IARCs and in promoting joint ventures between the participants thereby reducing the risk of overlap and wasteful duplication. Above all, it enhances the productive and reproductive capacity of NARCs.

These three programmes need to be strengthened and expanded, if the research centres are to provide the necessary packages for accelerated growth in the productivity and production of food crops including millet, maize and sorghum, in the most vulnerable part of Africa.

C. STRENGTHENING LINKAGES BETWEEN TRAINING, RESEARCH,
EXTENSION AND FARMING COMMUNITY.

27. Despite heavy investments in research little progress has been achieved in making available suitable and relevant improved technologies to the farmers and/or in bringing them to adopt the existing new technologies. The

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factors impeding the process of transfer and adoption of improved technologies are numerous and include technical as well as institutional ones. However, one of the most important constraints lies in the weak linkages among NARCs, IARCs and other external sources of technology and especially among training, research, extension and farming community.

28. Efforts are underway to bring about corrective measures and SAFGRAD has been active in doing so in the participating countries. However, owing to the dimension and magnitude of the problems much more needs to be done particularly through its training, Accelerated Crop Production Programme and Farming Systems Research Programme:

Training

29. Member states of SAFGRAD are experiencing serious shortages of adequately trained, experienced and dedicated professional and technicians to effectively carry out various agricultural research and extension programmes. Because of the lack of effective staff management policy and career development prospects, competent and well-trained scientists are often underutilized, misallocated in many countries, or simply working abroad. SAFGRAD is helping provide incentives to existing trained scientists, including through grant-in-aid programme by financing activities of regional interests and by involving them in other activities such as networking. This, hopefully, should help create a "reverse brain drain" situation for the benefits of agricultural research and development in Africa. Also, SAFGRAD is financing job training, short courses, and formal academic degree programmes to reduce the shortage of trained professional staff and technicians.

Accelerated Crop Production Programme (ACPP)

30. This programme is meant to provide a bridge between research and development programmes thereby tailoring research and extension activities to the needs and perception of the farmers. The ACPP is managed by an

Officer known as Accelerated Crop Production Officer (ACPO) who liaises between national, regional and international research groups, between national research and extension personnel and between research extension and farmers' communities. Indeed, the ACP provides efficient mechanisms for accelerated transfer of technologies generated by regional and international research centres to NARCs, extension services and to farmers and for giving feedbacks at each level of the chain. Currently five countries are involved in the ACP and there is need to expand the programme.

Farming Systems Research Programme

31. The FSR programme as conceived by SAFGRAD should provide mechanisms for effectively linking the activities particularly commodity research conducted by research centres to the activities and resource base of the ultimate beneficiaries. In particular, efforts are directed to better understand the farming systems including the farmers' decision-making process with respect to the allocation of scarce resources among competing activities and the production constraints so as to enable the research scientists, policy makers and developers to help alleviate and/or eliminate the constraints. These efforts should increase the chances of generating and transferring relevant technologies and induce farmers to learn and use advanced science and technology, to adopt better management methods for increasing production and improving cost-effectiveness. This approach to FSR is at its initial stage and every effort should be made to strengthen and expand the programme.

CHAPTER IV

SPECIFIC PROJECT PROPOSALS

A. Explanatory Notes Relating to the Summary of Project

32. The project proposals, which are based on the ideas developed in the Master Plan are presented in a summarized form. Also the cost estimates remain indicative. In particular, personnel cost for international staff would be changed to conform to the SAFGRAD standard which is under preparation. An estimate has been made for a training component in many of the subcomponents of the project. However, definite costing would depend on where the training would take place. Estimates of costs including equipment, materials and supplies do not take into account inflationary factors which will be accommodated when preparing detailed project documents. Administrative costs would depend on decision regarding the execution and location of each project. However, every effort would be made to make maximum use of existing facilities and research institutions or centres to minimize cost and increase efficiency. Provision of 13% of the budget is made to cover project servicing cost.

33. Although the Master Plan is looking towards years 2000, costings shown for the projects never exceed a period of five years which is considered to be reasonable for the purpose of this document. Also, the assistance of USAID, the major donor, is planned for five years. Finally, prudent management of long-term research projects requires a thorough review after four or five years, both to assess work done and to reconsider objectives in view of the results achieved and of new knowledge available.

34. Owing to the importance of the Master Plan for the development of agriculture in the semi-arid zones, the Executive Secretary of OAU/STRC had preliminary contacts with various governments and organizations, including USAID, United States Department of Agriculture (USDA), Cooperation for

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Development in Africa (CDA), World Bank, UNDP to request their support for the Plan. Interests were expressed by many of them to support the Plan. Also, actions are under way to induce member countries and OAU to increase their support to the activities of the Agency. IFAD and France pledged to continue and expand their support. Currently, a USAID team is preparing the Project document to extend its assistance to the Agency over the next 5 years.

35. Although the present paper would suffice for the purpose of attracting more donors and funds for the Agency, elaborated document would be required once the final project document of USAID support to SAFGRAD is made available and when interests for a specific component of the project is shown by a particular donor.

B. LIST OF PROJECTS

36. The total project budget is estimated at US \$ and includes the following major components:

1. Technical assistance The major long-term technical assistance is to be provided for research support and networking activities while the short-term assistance includes consultants for research programme development, and programme design, monitoring and evaluation design, special problems and evaluation.

2. Training - The project would support long-term (degree) and short-term (non-degree) training programmes. It will include US \$20,000 man/year for long-term training and US \$1,000 man/month for short-term training. Every effort should be made to ensure training within the continent.

3. Commodities. The principal commodity in the budget is vehicles and also includes motorcycles, word processors, mini-computers and other research equipment.

4. Scientists' Programme Support normally includes farm operations, supplies for farm, laboratory and office, vehicle operation and maintenance and travel. Research associate or assistant, Administrative assistant and secretarial support as support for the scientist programme, and the scientific conference and workshops, are also included in the operating cost.

5. Grants-in-Aid. Funding is provided for grants to scientists at selected NARCs for research of regional significance to the semi-arid areas of Africa. The individual grants to NARCs are in amount of about US \$250,000 per year.

6. Evaluation. A mid-term evaluation and a second evaluation near the termination date of the project are planned.

7. Project servicing cost is set at 13 per cent of the total budget and should serve to cover other expenses including administrative, management and financial control expenses. Also some international staff are to be supported by the overhead budget.

37. For the purpose of contacting various donors some of the components of the project are individually presented; these are put under the identified priority areas and include :

US \$ 000

Institutional Development

1. Strengthening the Coordination Capacity of SAFGRAD Agency

Generation of Improved Technologies

2. Strengthening Selected National Agricultural Research Centres to serve as Regional Research Centres in the Semi-Arid Zones of Africa.
3. Strengthening Collaborative Research with International Agricultural Research Centres for Increased and effective Support to National Agricultural Research Centres.

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US \$ 000

4. Resource Management Research Programme
Strengthening Linkages between Training,
Research, Extension and Farming Community.
5. Strengthening the Accelerated Crop Production Programme.
6. Strengthening the Farming Systems Research Programme.

38. The various components of the Project are mutually supportive and every effort should be made to mobilize the required resource for its full implementation over the period 1986 - 1990. Subject to the findings of the Evaluation of the Project by 1990, SAFGRAD intends to phase out its direct support of research on crops through CRSP with IARCs and to concentrate its efforts on networking and strengthening of the supportive role of IARCs to NARCs. After 1990 technical assistance will therefore be reduced to commodity coordinator.

39. The direct assistance to NARCs through ACPP and FSRP should also be reduced in intensity after 1990. At that period, it is expected that considerable progress would have been made in defining and executing programmes based on collective self-reliance through Project No.2, and that it would be possible for individual NARCs to release more resources for activities that are country specific in scope. SAFGRAD would still help to mobilize resources to support national programmes but it should not be involved in direct management of these. Therefore SAFGRAD would only finance the positions of FSRP and ACPP coordinators after 1990, so as to help organize the respective networks and to ensure coordination and integration.

40. During the next 15 years, every effort should be made to mobilize resources to build up the coordination capacity of SAFGRAD and the indigenous capacity of NARCs for greater collective self-sufficiency and self-reliance in agricultural research. The biannual meeting of the decision makers in research and development for the semi-arid zones should be promoted and given

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FOOD GRAIN RESEARCH AND DEVELOPMENT IN THE SEMI-ARID ZONE OF AFRICA 1986 - 2000

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